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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/541,597	04/03/00	SATO	K Q58614

IM62/0109
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EXAMINER	
ASHTON, R	
ART UNIT	**PAPER NUMBER**
1752	4

DATE MAILED: 01/09/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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Office Action Summary	Application No. 09/541,597	Applicant(s) Sato et al.
	Examiner Rosemary Ashton	Group Art Unit 1752

☒ Responsive to communication(s) filed on *Sep 11, 2000*.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-14* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☒ Claim(s) *1-3* is/are allowed.

☒ Claim(s) *4-13* is/are rejected.

☒ Claim(s) *14* is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *2*

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The use of parentheses in the claims makes the claim indefinite.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodall et al U.S. patent no. 6,136,499 in view of Allen et al U.S. patent no. 6,165,678.

As shown in Examples 56 and 57 in column 49 Goodall teaches a positive photoresist composition comprising a photoacid generator and a polymer having maleic anhydride (MA) and the tert-butyl ester of norbornene (TBN) as monomers (MA/TBN) in propylene glycol monomethyl ether acetate. The MA monomer meets the limitation of formula Ib in claim 9 wherein Z2 is oxygen and the TBN monomer meets the limitation of formula II in claims 9,10 wherein Z1 forms an alicyclic bridged structure and one of R13-R16 is an acid decomposing t-butyl group and n is 0 as in formula II-A as in claim 11. Goodall teaches other monomers meeting applicant's limitation of formula II in column 5, lines 30-67.

In column 29, lines 37-40, Goodall teaches solvents used in the photoresist composition. Goodall does not teach the solvent is a mixture of solvents as claimed by applicant in claim 9 or the addition of a base as in claims 12 and 13.

Allen teaches a photoresist composition comprising a polymer having alicyclic pendant groups and a photoacid generator. In column 10, lines 10-35 Allen teaches eight solvents, including propylene glycol monomethyl ether acetate, ethyl lactate and butyl acetate, and states solvent mixtures of the listed solvents may be used. A preferred solvent mixture is propylene glycol monomethyl ether acetate and ethyl lactate.

In column 10, lines 48-64 Allen teaches acid diffusion controlling agents such as a nitrogen basic compounds comprising those claimed by applicant in claim 13 such as pyrimidine and diazabicycloundecenes.

It would have been obvious to one of ordinary skill in the art to use a mixture of solvents of butyl acetate and ethyl lactate for the photoresist solvent of Goodall with a reasonable expectation of obtaining a successful resist composition because Allen teaches butyl acetate is a solvent alternative to propylene glycol monomethyl ether acetate in the solvent mixture.

As to claims 12 and 13 it is well known in the art that chemically amplified photoresists benefit from the addition of basic reagents that limit diffusion of the acid generated during resist exposure thus it would have been obvious to one of ordinary skill in the art to add a basic nitrogen compound, such as pyrimidine or a diazabicycloundecene, to the resist composition of Goodall with a reasonable expectation of obtaining a successful resist composition because Allen teaches these compounds stabilize the composition and control acid diffusion of the acid in the composition. The motivation to combine the art is to obtain a pattern having improved pattern resolution over a composition not containing the basic compound.

4. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodall et al cited above in view of Allen et al cited above and Aoai et al U.S. patent no. 5,824,451.

As shown above Goodall teaches a positive photoresist composition comprising a photoacid generator and a polymer having maleic anhydride (MA) and the tert-butyl ester of

norbornene (TBN) as monomers (MA/TBN). The MA monomer meets the limitation of formula Ib in claim 4 wherein Z2 is oxygen and the TBN monomer meets the limitation of formula II in claims 4,5 wherein Z1 forms an alicyclic bridged structure and one of R13-R16 is an acid decomposing t-butyl group and n is 0 as in formula II-A as in claim 6. Gooddall teaches other monomers meeting applicant's limitation of formula II in column 5, lines 30-67.

Goodall does not teach the resist composition comprises a surfactant as in claim 4 or addition of a nitrogen base as in claims 7 and 8.

The use of surfactants in photoresist compositions is well known in the art as shown in the teaching of Allen which in column 10, lines 4-10, lists the well known "customary additives" in resist compositions such as "dyes, sensitizers, additives used as stabilizers and acid-diffusion controlling agent, coating aids such as surfactants or anti-foaming agents, adhesion promoters and plasticizers". Allen teaches surfactants are used to control coating uniformity (col. 10, lines 64-65).

Aoai also teaches the resist "customary additives" and list surfactants of commercially available fluorine and silicon containing surfactants in column 63, lines 14-42.

It would have been obvious to one of ordinary skill in the art to add a fluorine or silicon containing surfactant to the resist composition of Goodall comprising the MA/TBN copolymer with a reasonable expectation of obtaining a successful resist composition because Allen teaches the addition of surfactant provides for a more uniform coating of the resist than without the surfactant.

As to claims 7 and 8 it is well known in the art that chemically amplified photoresists benefit from the addition of basic reagents that limit diffusion of the acid generated during resist exposure thus it would have been obvious to one of ordinary skill in the art to add a basic nitrogen compound, such as pyrimidine or a diazabicycloundecene, to the resist composition of Goodall with a reasonable expectation of obtaining a successful resist composition because Allen teaches these compounds stabilize the composition and control acid diffusion of the acid in the composition. The motivation to combine the art is to obtain a pattern having improved pattern resolution over a composition not containing the basic compound.

Allowable Subject Matter

5. Claims 1-3 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art does not teach a positive photoresist composition having the copolymer claimed and a compound that decomposes under the action of an acid to generate sulfonic acid. The closest prior art is Maemoto et al U.S. patent no 6,017,677 which teaches a positive photoresist composition comprising a polymer having pendant functional groups which generate sulfonic acid under the influence of acid.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach addition of a third solvent as claimed.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. Ashton whose telephone number is (703) 308-2057 or to Supervisory Examiner J. Baxter whose telephone number is (703) 308-2303.

December 29, 2000

ROSEMARY E. ASHTON
PATENT EXAMINER

Rosemary Ashton
Patent Examiner
Art Unit 1752